Data Sheet

Ultrastar™ SSD1000MR

Enterprise Solid State Drives

Highlights

- MLC NAND Flash for ultra-high performance and endurance
- Endurance: 2 drive writes per day (DW/D) for five years
- Best IOPs/Watt for reduced TCO
- 12Gb/s SAS interface for maximum throughput
- Advanced power loss data management technology
- Self-encrypting models conform to TCG's Enterprise specification

Applications/Environments

- Ultra-high performance tier-0 Read endurance enterprise storage
- Enterprise-class servers and high performance computing
- Space and/or power constrained environments
- Video pre/post-production
- Cloud computing

1000GB, 500GB and 250GB I MLC
2.5-inch SFF I SAS 12Gb/s

HGST Enterprise Storage Experience

HGST leverages decades of proven enterprise storage expertise in Serial Attached SCSI (SAS) design reliability, firmware, customer qualification and system integration to the new Ultrastar™ SSD1000MR solid-state drive (SSD) family. The synergistic relationship between HGST's new throughput-enhancing SSDs and traditional HDDs provides cost effective, end-to-end enterprise-class storage solutions, delivering reliability, compatibility, capacity, cost and system performance. This combination makes HGST a leading HDD/SSD provider with the experience and technology needed to meet escalating reliability, endurance, and performance in the most demanding enterprise environments.

Maximum Performance, Reliability, and Endurance

The new Ultrastar SSD1000MR delivers high sequential throughput, up to 1200MB/s read and 700MB/s write (12Gb SAS). The Ultrastar SSD1000MR also delivers up to 145,000 read and 20,000 write IOPS, reaching speeds >100 times faster than HDDs and double the speed of current 6Gb SSDs, allowing rapid access to "hot" enterprise data for improved productivity and operational efficiency. The new Ultrastar SSD1000MR family offers significant value in terms of IOPS per Watt, while reducing total cost of ownership (TCO) through low power consumption, efficient cooling and reduced space requirements.

The Ultrastar SSD1000MR family combines enterprise-grade MLC NAND flash memory, advanced endurance management firmware and power loss data management techniques to extend reliability, endurance, and sustained performance over the life of the SSD. The Ultrastar SSD1000MR family achieves an extraordinary 0.44% annual failure rate (AFR) or two million hour mean-time-between-failure (MTBF). The 1000GB capacity Ultrastar SSD endures up to 3.7 Petabytes (PB) of random writes over the life of the drive - the equivalent of writing 2.0 Terabytes (TB) per day for five years.

For complete end-to-end data protection and reliability, the Ultrastar SSD1000MR family incorporates the T10 Data Integrity Field (DIF) standard, extended error correction code (ECC), Exclusive-OR (XOR) parity to protect against flash die failure, parity-checked internal data paths without an external write cache, and an exclusive power loss data management feature that does not require supercapacitors. The Ultrastar SSD1000MR family is backed by a five year limited warranty, or the maximum Petabytes (PB) written (based on capacity).

Features and Benefits

	Feature / Function	Benefits
Performance	SAS 12Gb/s	6Gb/s Active-Active dual port or 12Gb/s single/dual port for enhanced reliability
	1200MB/s / 700MB/s sequential R/W	Highest write performance and endurance
	145K / 20K IOPS random R/W 36K IOPS on 70/30 mix R/W	Maximum throughput and IOPs for ultra-fast access to data. >100x faster than typical HDD
Power	9.0 & 11.0 Watts options	Improved performance with higher power option
Capacity	1000GB, 500GB, 250GB capacity	More capacity for less space and power
Reliability	0.44% AFR (2M hours MTBF)	Reduced field replacement effort
	1E-17 bit error rate	Enhanced error detection and correction for optimal data integrity
	T10 end-to-end data protection	
	Exclusive-OR (XOR) NAND	Protection against flash die failure
	Power loss data management	Assures data integrity during power failure
	Unlimited reads, up to 3.7PB writes (1000GB) random writes	Maximum endurance over the life of SSD
Integration	HDD architecture commonality	Compatibility with Ultrastar SAS HDD
	Extensive systems integration & test lab	Extensive interoperability and compliance testing

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HGST Quality and Service

HGST's Ultrastar SSD1000MR family extends the company's long-standing tradition of performance and reliability leadership. A balanced combination of new and proven technologies enables high reliability and availability to customer data.

How to read the Ultrastar model number

HUSMR1010ASS200 = 1000GB, SAS 12Gb/s

H = HGST
HOST = Ultrastar
S = Standard
MR = Multi-level cell Read Intensive (2DW/D)
10 = Full capacity — 1000GB
10 = Capacity this model, 10 = 1000GB (50 = 500GB, 25 = 250GB)
A = Generation code
S = Small Form Factor (vs. L for Large FF)
S2 = Interface, SAS 12Gb/s
0 = Reserved
0 = Crypto sanitize (1 = TCG encryption, 4 = No encryption, 5 = TCG + FIPs Certified Encryption)

Information and Technical Support

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Specifications

Models	HUSMR1010ASS200 HUSMR1050ASS200 HUSMR1025ASS200 HUSMR1010ASS201 HUSMR1050ASS201 HUSMR1025ASS201 HUSMR1010ASS204 HUSMR1050ASS204 HUSMR1025ASS204 HUSMR1010ASS205 HUSMR1050ASS205 HUSMR1025ASS205
Configuration	
Interface	SAS 12Gb/s
Capacity (GB)[1] at 512 bytes/sector	1000 / 500 / 250
Form factor	2.5-inch
Flash memory technology	Multi Level Cell (MLC)
Performance	
Read throughput (max MB/s, Seq.64K)	1200
Write throughput (max MB/s, Seq.64K)	700
Read IOPS (max IOPS, random 4K)	145,000
Write IOPS (max IOPS, random 4K)	20,000
Reliability	
Error rate (non-recoverable, bits read)	1 in 10^{17}
MTBF[2] (M hours)	2.0
Availability (hrs/day x days/wk)	24x7
Endurance (max PB[1], random write)	3.7 / 1.8 / 0.9
Acoustics	
Power	
Requirement	+5 VDC (+/-5%) +12VDC (+/-5%)
Operating (W)	9.0 & 11.0
Idle (W)	2.2 / 2.1 / 2.1
Physical size	
z-height (mm, max)	15.0
Dimensions (width x depth, mm)	70.1 x 100.6
Weight (g, typical)	164
Environmental (Operating)	
Ambient temperature	0° to 60° C
Shock (half-sine wave)	1000G (0.5ms) 500G (2ms)
Vibration, random (G RMS)	2.16, all axes (5 to 700 Hz)

[1] One gigabyte (GB) is equal to one billion bytes, one terabyte (TB) equals 1,000GB (one trillion bytes), and one petabyte (PB) equals 1,000TB (one quadrillion bytes) when referring to hard drive or solid state drive capacity. Accessible capacity will vary from the stated capacity due to formatting and partitioning of the drive, the computer's operating system, and other factors.

[2] MTBF target is based on a sample population and is estimated by statistical measurements and acceleration algorithms under nominal operating conditions. MTBF ratings are not intended to predict an individual drive's reliability. MTBF does not constitute a warranty.

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Product specifications provided are sample specifications and do not constitute a warranty. Information is true as of the date of publication and is subject to change. Actual specifications for unique part numbers may vary.

Please visit the Support section of our website, www.hgst.com/support, for additional information on product specifications. Photographs may show design models.

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